Appendix B

Discussion of Utility Regulation

Primer on Regulated Water Utilities

Water utilities can be divided into those that are owned by public entities such as cities, towns and counties and those that are owned by private investors. The objective of governmentally owned utilities is to provide acceptable levels of service at minimum cost. The objective of investor owned utilities is to provide acceptable levels of service at a maximum profit to the investors. Investor owned water utilities are businesses that do not function in the same way as most other businesses in the United States. The structure of such utilities and the business decisions they make are determined in a large part by the regulatory environment in which they exist.

The following discussion describes the main elements of the way charges for water utilities are set. The discussion uses terminology in the context of the New Hampshire Public Utilities Commission (NHPUC) but is typical of terminology and practice throughout the United States.

Impacts of Regulation on Investor Owned Water Utilities

An underlying assumption of our economic system is that for any given product there is a market place in which a number of buyers and sellers are free to negotiate the most favorable terms of exchange between themselves with only ordinary protections against criminal behavior required to be furnished by society at large. We consider that the natural outcome of unconstrained monopoly will be exploitation of the captive monopoly customers.

The physical characteristics of water supply systems is that there is only one system in a community. Within limited ranges, water customers there can adjust their use of water in response to changes in price but for the most part they are captive customers who are unable to provide a practical, meaningful competitive environment that would regulate water prices.

Monopolies such as water utilities cannot be avoided without creating hugely inefficient infrastructures. For example, water utility competition would require the presence of at least two complete sets of physical facilities such as mains, hydrants, storage tanks and treatment works competing to serve the same customer base. Even if both systems were to operate at no profit it is clear that such an arrangement must have much higher costs than would otherwise be necessary.

The problem of incorporating "natural" monopolies into our economy has lead to the development of systems of state regulation on utility monopolies in which the state functions as the competitive environment through the activities of a regulatory body often known as a public utilities commission.

The function of the utilities commission is to set the rates and conditions of utility service for each regulated utility within its jurisdiction. The process through which the amount of rates and the conditions of service are established is grounded in a body of laws, administrative regulations and court decisions developed over the last 100 years that is sometimes collectively referred to as the "regulatory compact" between the public and the monopoly utilities.

The "compact" is that if the utility agrees to provide non-discriminatory service to customers within its franchise area, the regulators will allow it to charge rates that will allow the utility's investors to receive income from their investments and a regular return of the investment. There is not a guarantee of an explicit return on investment but rather a guaranteed opportunity to earn such a return. The role of the regulator is to serve as a substitute for competiton.

The following steps occur in setting the rates to be charged:

1. Determine what the investment is in the utility.
2. Determine a "fair" rate of return **on** the investment.
3. Calculate the required return on the investment.
4. Provide for the return **of** the investment.
5. Establish the expenses the utility will incur.
6. Calculate the total revenue required to be collected.
7. Allocate the revenue requirement among customers.

The Process

Investment = Rate Base. The rate regulation process for a utility begins with a determination of how much investment has been made in the company. If a company has made an investment of "x" dollars and a fair rate of return is "y", then the company should be allowed to charge rates that would result in its receiving "x" times "y" income. This is generally the income after all taxes.

The totality of investments that are dedicated to bona fide utility service is known as the utility's rate base. The bulk of rate base is typically tangible, physical plant that has been determined to have been prudently acquired and to be used and useful for utility purposes.

A utility typically has both tangible and intangible investments. The tangible investments devoted to providing service are often referred to as the Utility Plant in Service (or UPIS). A utility may also own tangible property that is not yet in utility service, that is unrelated to the utility's purpose or that it acquired but did not pay for.

Utility plant that is in the process of being constructed is known as Construction Work in Progress (or CWIP). Until this plant is placed into service, its value is excluded from rate base in most jurisdictions (including New Hampshire). New plant may be determined to be not prudent, used or useful and excluded from rate base even though the utility has spent money on it. New Hampshire requires utilities to notify the New Hampshire Public Utilities Commission (NHPUC) prior to undertaking significant projects making disallowance of projects unlikely.

A utility may own tangible property that is not related to its purpose. This property would not contribute to the utility's ability to provide service and is excluded from rate base.

Lastly, most utilities acquire tangible property at reduced or no cost. Generally, a utility cannot add more new plant to acquire a customer than the average investment it has in existing customers. To do so would unfairly subsidize the new customer at the expense of the existing customers. A new customer that wants to be served can contribute the cost of the difference to the utility in a variety of ways known collectively as Contribution in Air of Construction (or CIAC). Since it does not represent an investment by the utility, CIAC is excluded from rate base.

There are a variety of intangible items often included in rate base. The most common are working capital, expense items that are being written off over a period of several years or expenses that are mandated by regulatory agencies such as major studies. If these expenses were recovered in the years in which they were incurred it would cause rates to bounce up and down in an unpredictable manner.

What Should a Utility Earn. The next step in the process is to determine the rate of return on investment to be allowed the utility. The utility must earn a sufficient return on the investments by its stockholders to be able to attract new investors and sufficient return on the money it has borrowed to pay back its lenders.

Investment money comes from shareholders and lenders. Shareholders own a proportional piece of the company (equity) and lenders have first claim on the company's assets. Because their claim on earnings is first in line, lenders will usually accept a lower return (interest rate) on their investment than will shareholders.

Since the lowest rate of return is the least burden on ratepayers, it would seem that maximizing debt over equity investment would be the best strategy to follow. Lenders must always be paid each year and if a year has poor earnings (say because for a water utility the summer was wetter than normal), a company with too much debt may have a hard time making payments. Indeed, lenders may require higher interest rates if they perceive that a company has too much debt.

A ratio of 50% debt and 50% equity is currently viewed as being a desirable goal. Since this blend of debt and equity is a permanent relationship, utility loans are a structured with the entire principal amount due in 10 to 20 years; when the loan comes due, the entire amount is refinanced (or rolled over). This debt is sometimes referred to as being embedded in the company's financial structure. The return on debt is the overall interest rate on the company's embedded debt, which may consist of a number of different loans at different interest rates.

The equity of the company is the amount the original shareholders paid for their shares plus whatever amount of periodic earnings are reinvested in the company from year to

year. Regulators look into the stock market to see what rate of earnings per share are required by stock purchasers for similar utility companies.

The required returns on debt and equity are blended into a single return on investment value. For example, if the cost of debt is 8% and the markets indicate 12% is a required return on equity, then the rate of return would be set at 10% for a company with equal amounts of debt and equity.

Revenue Requirement. The rate base multiplied by the return on investment is the amount required to service the debt payments and, theoretically, allow the company to sell new stock without decreasing the value of the outstanding shares of stock. This is the money the company should have after paying all of its expenses including its income taxes. It is considerably less than the company needs to charge its ratepayers.

Getting Capital Back. Utility investment is widely perceived as being investment that will be returned to the investor on a regular, rational basis and the capital purchased with the investment is used up. Depreciation is the mechanism by which this return of investment is accomplished. If an investment of $100 is made in a pipe with a life of 100 years, it would be appropriate to depreciate that pipe by 1% or $1 per year. Annual depreciation is considered to be an operating expense and the total claimed depreciation is deducted from the utility plant account and, therefore, reduces rate base by that amount which theoretically represents the amount of plant that is no longer being used.

Utility Plant in Service less accumulated depreciation is also known as the utility's net plant or net book value.

In the case of our hypothetical $100 pipe, if it were still servicing customers after 100 years it would have to be replaced with another pipe that would then become part of the utility's plant and rate base.

Although there is no requirement for the utility to do anything with depreciation than pay it to investors, without the reinvestment of at least some of this amount, the rate base will ultimately decline to zero and the utility will have no requirements for earnings.

Determining the correct rate of depreciation for a utility is as much art as it is science although there are a number of widely accepted approaches to analyzing patterns of changes in dollar amounts of classes of investment as a means of calculating the useful life (and thus depreciation rates) of classes of utility properties.

The periodic reduction in the value of intangible assets is called amortization and is similar in philosophy to depreciation.

Adding in the Expenses. In addition to depreciation and amortization charges, a utility incurs many actual expenses. These are dominated by employee related expenses and the cost of fuel or energy.

During the rate setting process, it is typical to select and examine a recent year's actual expenses. This period of time is called a test year and test year expenses are adjusted to reflect abnormally high and low expense levels from which expenses can be projected into the future. These expenses also include the taxes not related to income.

Finally, an amount must be calculated for the income taxes to be paid.

Gross Revenue Requirement. The total of all the amounts above, that is, return on and of investment and expenses including taxes, is the amount that must be collected from rates charged to customers or from investments or other charges for services.

Setting the Rates. The charge for each individual unit of service is determined by dividing the number of units of service into the gross revenue requirement. The exact calculation is generally done by performing a cost of service study. This study attempts to allocate the costs of service between various classes of customers. It also attempts to determine which costs are fixed and which vary with the amount of commodity the utility delivers.

There are many subjective aspects to allocating costs of service and the public utility commission attempts to require an equitable distribution of costs among customer classes in setting rates. This may include some elements of social policy as, for example, in establishing "lifeline" rates for low income customers. This shifts some of the costs onto other customer classes for the good of the larger community.

The Tariff. Once the costs to be charged are determined, they are expressed in a document known as a tariff which is filed with the commission and becomes the official basis for the utility to charge its customers for its services.